486SH

VL-Bus System Board

USER'S MANUAL

Revision 1.1

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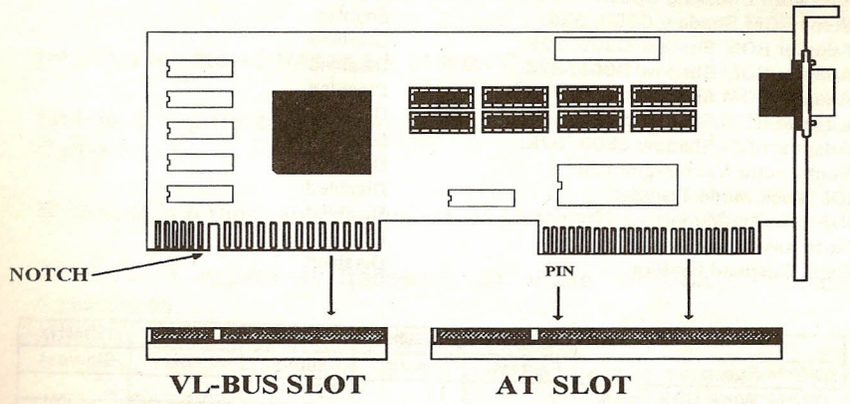
!!! WARNING !!!

Be careful while installing VESA Local Bus cards on to your system board. Keep the following tips in mind to properly install and remove a VESA Local Bus card.

1. Always install/remove the card vertically straight down/up. **Never at an angle!** Inserting the card at an angle may damage the pins in both the AT and VESA Local Bus slots.

2. To install the board vertically, hold the card in the middle. Make sure that the card is even with both slots. Then gently fit the card into the slots with equal pressure at both ends.

Manufacturer warranty does not cover damage caused to the system board by improper installation or removal of VESA Local Bus cards.



486SH QUICK REFERENCE

I. STANDARD CMOS SETUP

Date:	Current date
Time:	Current time
Hard Disk C: Type:	Hard disk parameters
Hard Disk D: Type:	Hard disk parameters
Floppy Drive A:	Type of floppy drive installed
Floppy Drive B:	Type of floppy drive installed
Primary Display:	Type of video card installed
Keyboard:	Installed

II. ADVANCED CMOS SETUP

Typematic Rate Programming:	Disabled
Typematic Rate Delay:	500
Typematic Rate:	15
Above 1MB Memory Test:	Disabled
Memory Test Tick Sound:	Enabled
Memory Parity Error Check:	Enabled
Hard Disk Type 47 RAM Area:	0:300
System Boot Up NumLock:	On
Floppy Drive Seek At Boot:	Disabled
System Boot-Up Sequence:	A:, C:
External Cache Memory:	Enabled
Internal Cache Memory:	Enabled
Password Checking Option:	Setup
Video ROM Shadow C000, 32K:	Enabled
Adapter ROM Shadow C800, 32K:	Disabled
Adapter ROM Shadow D000, 32K:	Disabled
Adapter ROM Shadow D800, 32K:	Disabled
Adapter ROM Shadow E000, 32K:	Disabled
Adapter ROM Shadow E800, 32K:	Disabled
Boot Sector Virus Protection:	Disabled
IDE Block Mode Transfer:	Disabled
IDE Standby Mode:	Disabled
Auto Key Lock Timeout:	Disabled
Cyrix Suspend Feature:	Disabled

	20MHz	25MHz	33MHz	40MHz	50MHz
DRAM Speed	Fastest	Fastest	Faster	Slower	Slowest
DRAM Write CAS Pulse	1T	1T	1T	2T	2T
DRAM Write Cycle	0 W/S	0 W/S	0 W/S	1 W/S	1 W/S
Cache Write Cycle	2T	2T	3T	3T	3T
Cache Burst Read Cycle	1T	1T	2T	2T	2T
ISA Bus Clock	1/3 CLK	1/3 CLK	1/4 CLK	1/5 CLK	1/6 CLK
Latch Local Bus Device	2T	2T	2T	2T	2T
Local Bus Ready	TRANS	TRANS	SYNC	SYNC	SYNC

DRAM Hidden Refresh: Enabled

PREFACE

Thank you for purchasing the 486SH system board. This document gives an aid to the configuration and installation of this system board.

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CHAPTER 1: INTRODUCTION

The 486SH system board adds to our 486 product line high integration and cost effective solution without compromising performance and quality. With top speed at 50MHz and integrated 64K/128K/256K Write-Back cache, the 486SH dramatically boosts system throughput for even the most demanding applications. The 486SH offers features and functionality exceeding any other system board in its class, including:

CPU:

- Intel i486DX, i486DX2, i486SX, i487SX, P24T, and Overdrives.

Cache Memory:

- Supports 64K/128K/256K cache memory.

Main Memory:

- Supports 256Kx9, 1Mx9, and 4Mx9 SIMM modules.
- Up to 32 MBytes on-board memory.

Slots:

- Three 32-bit VESA Local Bus slots.
- Six 16-bit ISA bus slots.
- One 8-bit ISA bus slot.

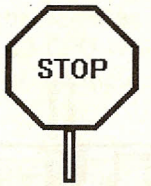
Green PC:

- CPU clock-slow-down and monitor shut-down features.

On-Board Battery:

- 3.6V/60mA on-board battery.

CHAPTER 2: JUMPERS & CONNECTORS



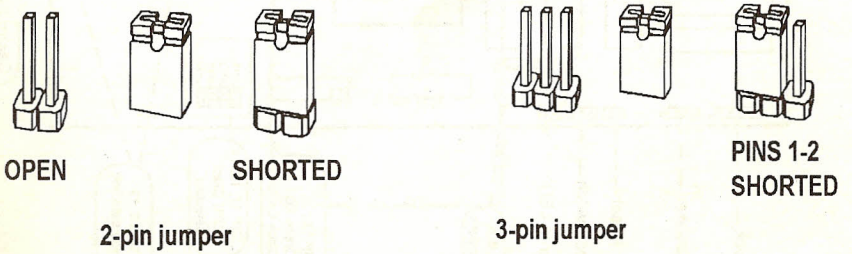
When working with the 486SH, it is extremely important that you avoid static electricity. Always ground yourself by wearing a wrist or ankle strap.

Figures 1 on the next page shows the component layout of the 486SH system board with locations of the system board jumpers and connectors. Note that most jumpers and connectors on the system board are labeled with proper names with pin 1 marked as '1'. To avoid damaging the board and to have proper operation caution should be taken when connecting these components.

SYSTEM BOARD JUMPERS

Jumpers are used to select between various operating modes. A jumper switch consists of two, three, or four gold pins projecting from the system board. Placing the plastic jumper cap over two pins connects those pins and makes a particular selection. Using the cap to cover two pins in this way is referred to as shorting those pins. If the cap is not placed on any pins at all, this is referred to as leaving the pins open.

Note: When you open a jumper, leave the plastic jumper cap attached to one of the pins so you don't lose it.



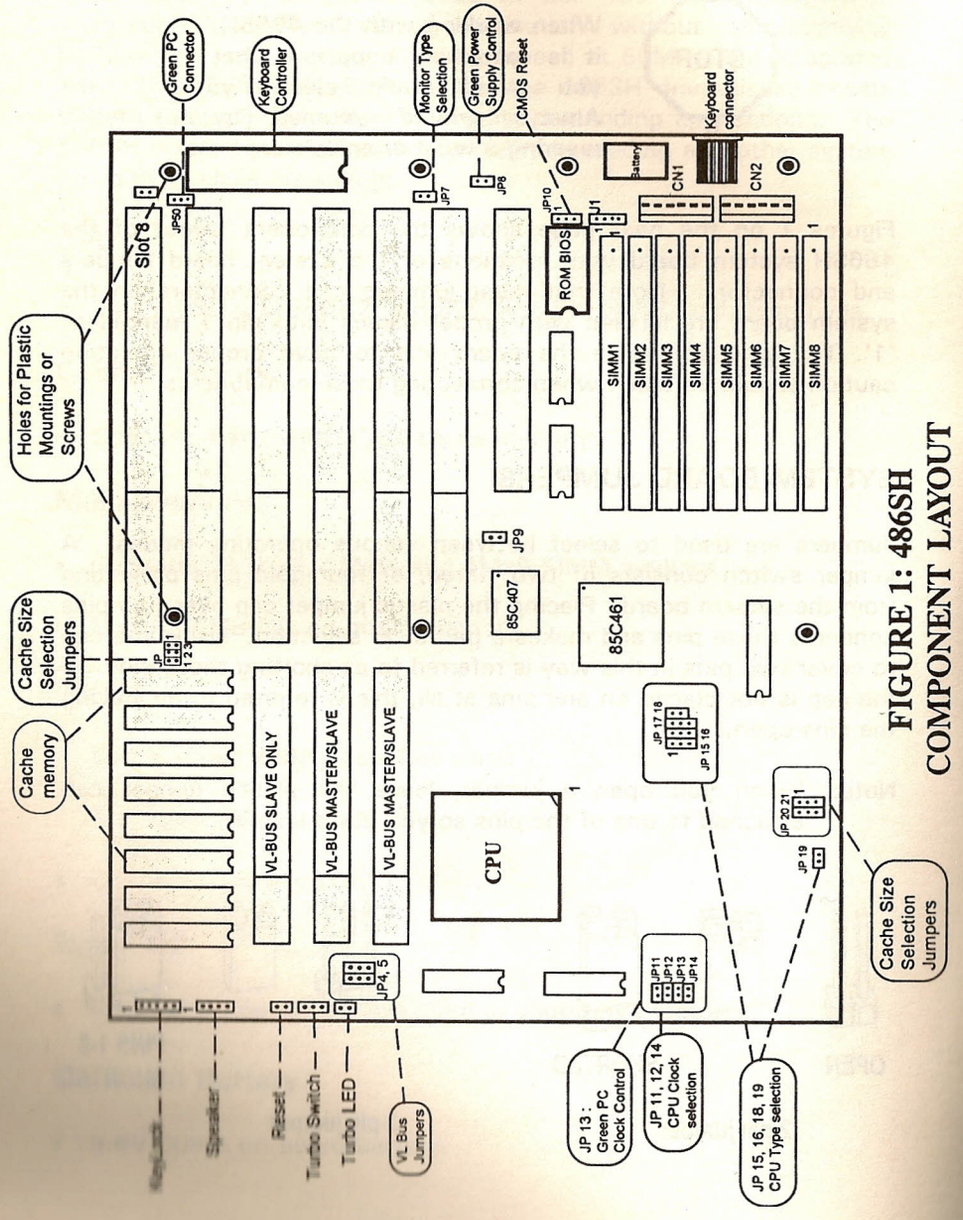


FIGURE 1: 486SH COMPONENT LAYOUT

CPU External Clock Jumpers

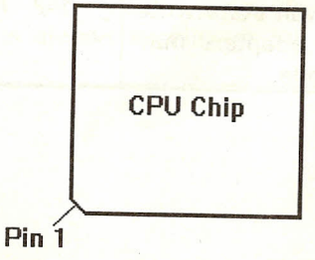
If you are installing an i486DX, or i486SX the internal CPU clock speed is the same as the external CPU clock speed. This is different for i486DX2 CPU where the external speed is one-half of the internal speed. For example, a 486DX2-66 has an external clock speed of 33MHz.

CPU External Clock Speed	JP11	JP12	JP14	JP5
20MHz	OPEN	OPEN	SHORT	1-2
25MHz	SHORT	SHORT	OPEN	1-2
33MHz	SHORT	OPEN	OPEN	1-2
40MHz	OPEN	SHORT	OPEN	2-3
50MHz	OPEN	OPEN	OPEN	2-3

CPU Type Jumpers

CPU Type	JP15	JP16	JP18	JP19
486DX, 486DX2	1-2	1-2	SHORT	SHORT
487SX, ODP486SX	1-2	2-3	SHORT	SHORT
486SX	2-3	OPEN	OPEN	SHORT
QFP486SX	2-3	OPEN	OPEN	OPEN

Care should be taken when installing the CPU into the Pin Grid Array (PGA) socket on the system board. Make certain that pin 1 of the CPU chip is correctly aligned with pin 1 of CPU socket. The location of pin 1 on the CPU is denoted by a small notch.



Cache Size Jumpers

The system board supports 64KB/ 128KB/ 256KB of cache memory.

Cache Size Jumper Selection

Cache Size	JP1	JP2	JP3	JP20	JP21
64KB	1-2	2-3	1-2	1-2	1-2
128KB	1-2	1-2	2-3	1-2	2-3
256KB	2-3	2-3	2-3	2-3	2-3

Cache Size and SRAM Locations

Cache Size	Tag RAM U36	Data Bank 0 U2,U4,U6,U8	Data Bank 1 U1,U3,U5,U7
64KB	8Kx8	8Kx8	8Kx8
128KB	32Kx8	32Kx8	None
256KB	32Kx8	32Kx8	32Kx8

VESA Local Bus Jumpers

Jumper JP4 allows any VL-Bus adapter to identify the speed of the system board.

High Speed Write	JP4
System board runs one wait state write transfer. All VL-Bus adapters can operate in this mode.	2-3 (Default)
System board runs zero wait state write transfer. Some VL-Bus adapters may not be able to run this mode.	1-2

Clear CMOS Data Jumper

The CMOS jumper JP10 is used to clear the system configuration data currently stored in the CMOS RAM. All system setup information (hard disk type, date/time, etc...), stored in the CMOS, will be destroyed. This function would be useful if you were to forget the user password for the system.

Function	JP10
Normal CMOS Operation	1-2 (Default)
Clear CMOS Data	2-3

Display Type Jumper

Display Type	JP7
Video display is VGA, EGA, or Monochrome.	OPEN (Default)
Video display is CGA.	SHORT

Green PC Jumper

Clock Control	JP13
Enable Green PC clock-slow-down control. During specified idle period, CPU clock is slowed down to 8-MHz to conserve power.	SHORT (Default)
Disable Green PC clock-slow-down control. CPU is always running at full speed.	OPEN

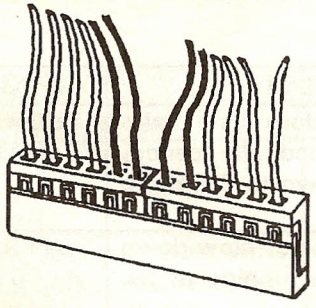
SYSTEM BOARD CONNECTORS

Following is the list of 486SH system board connectors required to be installed for proper system operation.

- Power supply connectors (CN1, CN2)
- External battery connector (J1)
- Keyboard connector (KB1)
- Power LED and keyboard lock connector (KEYLOCK)
- Speaker connector (SPEAKER)
- Reset connector (RESET)
- Turbo switch connector (TB SW)
- Turbo LED connector (TB LED)
- Green PC Connectors (JP8, JP50)

Power Supply Connectors

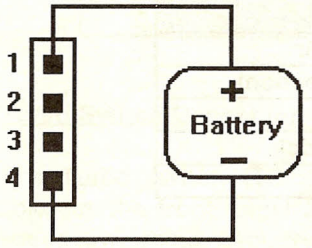
The two Power Supply connectors, CN1 and CN2, are 6-pin AT standard power connectors. Most power supplies have two six-wire connectors, two of the wires on each connector are black. Align the two six-wire connectors so that the two black wires on each connector are in the middle as shown below.



Pin	Connector CN1	Connector CN2
1	Power Good	Ground
2	+5 VDC	Ground
3	+12 VDC	-5 VDC
4	-12 VDC	+5 VDC
5	Ground	+5 VDC
6	Ground	+5 VDC

External Battery Connector

The external battery connector (J1) is a 4-pin keyed BERG strip. It is used to connect +4.5 Volt external battery (in case the on-board battery capsule is not installed) to provide power to the system board Real-Time Clock and CMOS memory when the system power is off. For an external battery, the battery's cable connector attaches to pin 1 and 4 of J1 as shown below.



External Battery Connection

Keyboard Connector

The keyboard connector is a 5-pin, circular-type DIN socket. It is used to connect the system board keyboard interface to any standard AT-compatible keyboard (84 or 101 -key type keyboards). The pin assignment is shown below:

Pin	Description
1	Keyboard Clock Signal
2	Keyboard Data Signal
3	Not Used
4	Ground
5	+5V Fused VDC

Power LED and Keyboard Lock Connector

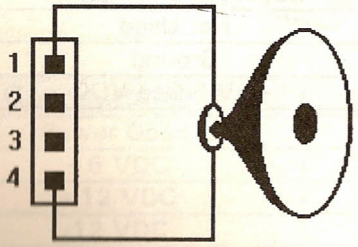
The Power LED and Keyboard Lock connector (KEYLOCK) is 5-pin keyed BERG strip. It is used to connect +5 VDC power to the power indicator LED at the front panel and connect security keyboard lock to the keyboard controller. This allows you to switch off the keyboard and so provide limited security against casual intruders. The pin assignments are indicated below:

Pin	Description
1	LED Power
2	Key (No Connection)
3	Ground
4	Keyboard Lock
5	Ground

Speaker Connector

The Speaker connector (SPEAKER) is a 4-pin keyed BERG strip. It is used to connect an external 2-inch, 8-ohm speaker to the system board to provide sound capability. The pin assignments are defined below:

Pin	Description
1	Speaker Data Out
2	Key (No Connection)
3	Ground
4	+5 VDC



Speaker Connection

Reset Connector

The system RESET connector (RESET) is a 2-pin BERG strip. It is used to connect the push button reset switch located on the front panel to the system board. System reset can be done by shorting pin 1 to pin 2 with the same effect as turning the power off and then on again.

Pin	Description
1	Reset Input
2	Ground

Turbo Switch Connector

The Turbo switch (TB SW) is a 2-pin BERG strip. It is used to connect the front panel 2-position push switch to the system board speed switching circuitry. In Turbo speed, the cache memory is enabled and full speed of 32-bit memory transfer is utilized. In non-turbo speed, the cache memory is disabled. In both speeds, the ISA expansion bus timing compatibility is still preserved.

Pin	Description
1	Turbo Speed
2	Ground

Notes:

- System runs at Turbo speed when pins 1 and 2 are shorted.
- System runs at Slow speed when pins 1 and 2 are open.

Turbo LED Connector

The Turbo LED connector, marked as 'TB LED', is a 2-pin BERG strip. It is used to connect a CPU operating frequency indicator LED from the front panel to the system board. The pin assignments are indicated below:

Pin	Description
1	LED Cathode
2	LED Anode

Green PC Connectors

This function requires AMI Megakey keyboard controller. To program the Green PC feature, use BIOS Power Management Setup.

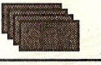
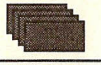
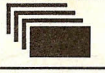
Pin	JP8
1	Keyboard P11. Use this pin for controlling general purpose Green PC device. When signal on this pin goes low, the external Green PC device connected to this pin should go into power saving state. This pin must be programmed through BIOS Power Management Setup.
2	Ground

Pin	JP50
1	Keyboard P12. Connect this pin to the Video card's **Feature Connector** (also called **VGA Pass-Through connector) Sync Enable pin 18**. During power saving mode (if enabled through system BIOS), signal on this pin goes low to turn OFF the **Vertical/Horizontal Sync** going to the display monitor to conserve power. This pin must be programmed through BIOS Power Management Setup.
2	Keyboard P13. Use this pin for controlling general purpose Green PC device. When signal on this pin goes low, the external Green device connected to this pin should go into power saving state. This pin must be programmed through BIOS Power Management Setup.
3	Keyboard P15. Use this pin for controlling general purpose Green PC device. When signal on this pin goes low, the external Green device connected to this pin should go into power saving state. This pin must be programmed through BIOS Power Management Setup.

CHAPTER 3: INSTALLATION

THE DRAM SIMMs

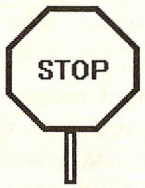
The on-board DRAM memory subsystem has eight module mounting sockets which are divided into "banks' of four sockets each. These banks are labeled Bank 0 and Bank 1. Single In-Line Memory Module (SIMM) added to these banks must be installed a full bank at a time. Start with bank 0, then work your way up. DRAM speed must be 80ns, 70ns, or 60ns. You can configure the memory of the 486SH in a variety of ways. The chart below shows the possible combinations.

Total Memory	Bank 0	Bank 1
1MB		
2MB		
4MB		
8MB		
20MB		
16MB		
32MB		

Four 256KB SIMMs = 1MB

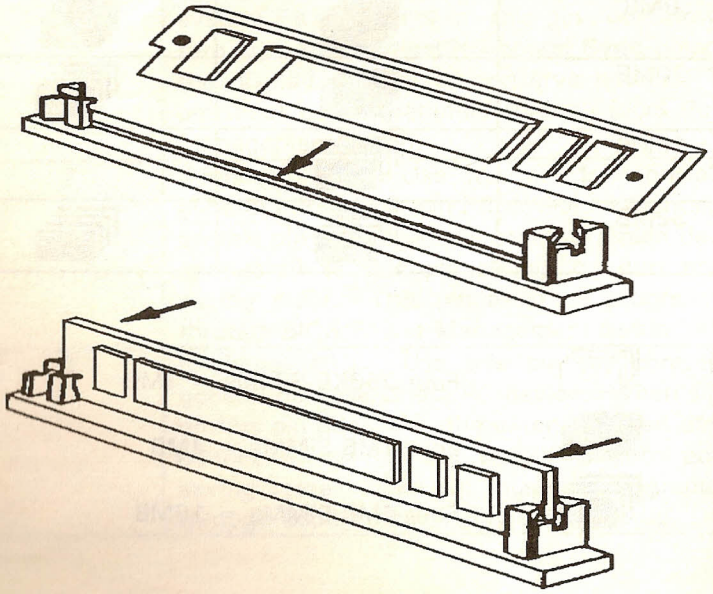
Four 1MB SIMMs = 4MB

Four 4MB SIMMs = 16MB



When working with DRAM SIMMs, it is extremely important that you avoid static electricity. Always ground yourself by wearing a wrist or ankle strap.

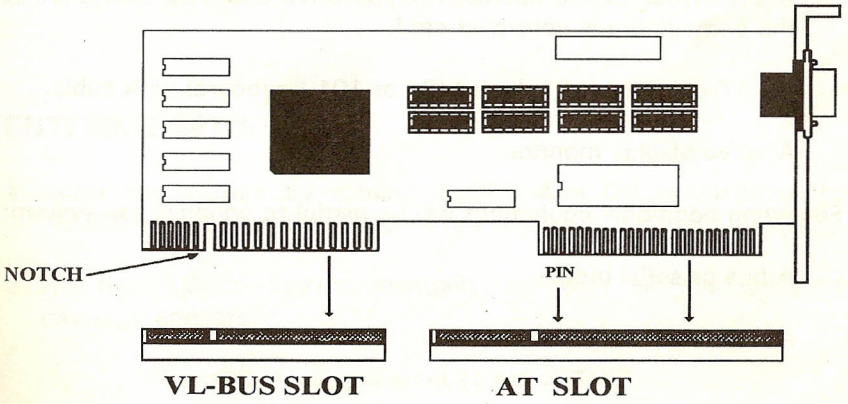
1. The SIMM modules should face to the left towards ISA bus slots.
2. Insert the SIMM at a 45 degree angle, tilted away from the ISA slots.
3. Gently push the SIMM to an upright position until it "snaps" into place.
4. Repeat above steps until the entire bank is filled.



INSTALLING A VL-BUS CARD

Carefully follow these steps to install a VL-Bus card:

1. Turn off your computer and unplug the power cord.
2. Turn off the power to all peripheral devices, such as your printer.
3. Disconnect the cables from the back of the system in order to give more room to work. Note how all cables are connected prior to disconnection.
4. Remove the computer's cover.
5. Choose an unused VL-Bus slot.
6. Setting the VL-Bus card according to its user's manual.
7. Holding the card at the center of the top edge, gently push straight down with equal pressure at both ends.
8. Replace the screw to hold the card into place.
9. Replace and secure the system cover.
10. Reconnect all the wires and cables.



EQUIPMENT REQUIRED

The dimension of the 486SH system board is designed to fit perfectly in a PC/XT (or PC/AT) standard case. To build a complete high performance system based on the 486SH system board, the following equipment are needed:

A chassis with dimension similar to PC/XT/AT standard chassis.

A standard AT 220W power supply which is capable to provide a continuous power within a +4.85 VDC to +5.25 VDC range. A power line filter may be needed for areas with noisy transmission.

A 2-inch, 8-Ohm speaker to provide sound capability.

A 2-position switch with a 2-pin connector for speed function.

A push button switch with 2-pin connector for reset function.

One floppy drive (360K or 1.2M or 1.44M).

Hard disk drive.

A combinational hard disk and floppy disk controller card.

A video card (Monochrome, CGA, EGA, VGA).

A set of flat cables between floppy drive and hard disk drive to the combinational controller card.

An AT-compatible keyboard (84 or 101 Keyboard) with cable.

A video display monitor.

Following additional equipment will be useful to enhance the system:

A bus or serial mouse.

A tape pack up drive.

CHAPTER 4: BIOS SETUP

You need to setup a system once every time:

- You start a new and unconfigured system.
- You receive a start-up error message indicating the configuration information stored in the non-volatile CMOS RAM has somehow become corrupted.
- You add, remove or change peripherals from your system.

The first time you power up the system, the configuration information stored in the battery-backed CMOS RAM may not be correct. The BIOS detects this condition and prompts user to go through the SETUP section. This chapter explains how to use the BIOS SETUP program and make the appropriate entries.

Some of the parameters are already factory preset and do not need to be changed. Please read the instructions carefully and only change the settings if necessary.

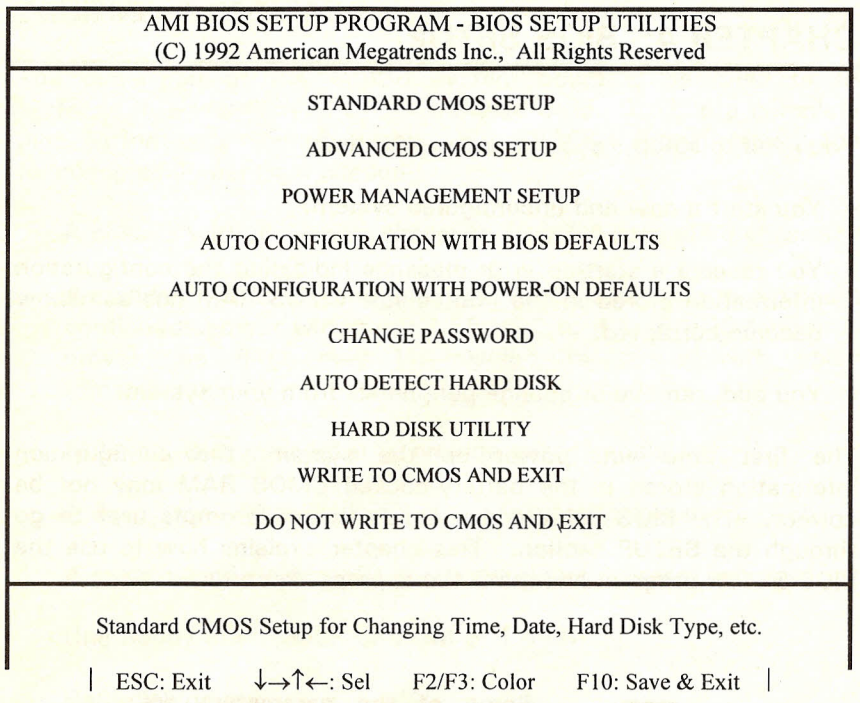
ENTERING SETUP

1. Reset the system by turning it OFF then ON or pushing the "RESET" button on the system front panel.

2. Hit the <**Del**> key momentarily as soon as the following message appears:

   "Hit <DEL>, if you want to run SETUP"

3. After you press the <**Del**> key, the following BIOS Setup screen appears:


AMI BIOS SETUP PROGRAM - BIOS SETUP UTILITIES
(C) 1992 American Megatrends Inc., All Rights Reserved
STANDARD CMOS SETUP
ADVANCED CMOS SETUP
POWER MANAGEMENT SETUP
AUTO CONFIGURATION WITH BIOS DEFAULTS
AUTO CONFIGURATION WITH POWER-ON DEFAULTS
CHANGE PASSWORD
AUTO DETECT HARD DISK
HARD DISK UTILITY
WRITE TO CMOS AND EXIT
DO NOT WRITE TO CMOS AND EXIT
Standard CMOS Setup for Changing Time, Date, Hard Disk Type, etc.
ESC: Exit ↓→↑←: Sel F2/F3: Color F10: Save & Exit

4. Choose an option and press <**Enter**>. Modify the system parameters to reflect the options installed in the system.

5. Press <**Esc**> at anytime to return to the Main Menu.

6. In the Main Menu, choose "**WRITE TO CMOS AND EXIT**" to save your changes and reboot the system. Choosing "**DO NOT WRITE TO CMOS AND EXIT**" ignores your changes and exits the BIOS SETUP program.

In each setup screen, the following common keyboard controls may be used:

<**F1**>	: Help
<**F2**>, <**F3**>	: Color (to change screen color)
<**F5**>	: Old Setup Values
<**F6**>	: BIOS Setup Default Values
<**F7**>	: Power On Default Values
<**ESC**>	: Exit Setup Section
Arrow Keys	: Select Setup Item
<**PG UP/ PG DN**>	: Modify the Setup Item

STANDARD CMOS SETUP

Use the standard CMOS Setup screen to check or modify general configuration information such as the date, time, floppy type, hard disk type, video type, etc.

- ***Date*** (Month/Date/Year): On the bottom right corner of the screen, a calendar has been provided for user. You manually set the electronic calendar only if the values are incorrect.

- ***Time*** (Hour/Minute/Second): The time here is 24-hour time. You would enter 5:30 P.M. as 17:30:00.

- ***Hard Disk C:/D: Type***: The BIOS provides 46 predefined types of popular hard disk drives. Relevant specifications include the number of cylinders and heads, write pre-compensation time, read/write head landing zone, number of sectors per track. A hard disk will not work properly if your enter incorrect drive parameters.

  If your particular drive is not one of the 46 pre-defined types, simply scroll down to select type 47 and enter the appropriate values for **cylinders**, **heads**, **WPcom**, **LZone**, and **sectors**. **Size** is automatically determined by the other entries. You can also let the BIOS to determine the drive type by selecting "**AUTO DETECT HARD DISK**" from the Main Menu.

- ***Floppy Drive A: Type*** (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB, or Not Installed): Specify the type of the first floppy drive installed on the system. 'Not Installed' could be used as an option for diskless workstations.

- ***Floppy Drive B: Type***: Specify the type of the second floppy drive installed on the system.

- ***Primary Display Monitor*** (Color 40x25, Color 80x25, VGA/PGA/EGA, Monochrome): The 'Not Installed' option could be used for network file servers.

- ***Keyboard*** (Installed / Not Installed): Default is "Installed". "Not Installed" allows your system to operate without keyboard.

After all selections have been done, press <**Esc**> key to exit this section.

ADVANCED CMOS SETUP

"ADVANCED CMOS SETUP" lists some system features that allows you to fine tune your system setup.

- ***Typematic Rate Programming***: Choose Enabled or Disabled. Enable this option to adjust the keystroke repeat rate. Adjust the rate via Typematic Rate Delay and Typematic Rate.

- ***Typematic Rate Delay***: Choose the delay between holding down a key and when the character begins repeating. Default is 500milliseconds.

- ***Typematic Rate***: Choose the rate a character keeps repeating. Default is 15 characters per second.

- ***Above 1MB Memory Test***: Default is "Disabled" to speed up power-on initialization process and the BIOS will only test the extended memory every 32K locations only to determine the on-board memory size.

- ***Memory Test Tick Sound***: Default is "Enabled" for the ticking sound during memory test.

- ***Memory Parity Error Check***: Default is "Enabled" to test for transmission errors in data read from memory.

- ***Hard Disk Type 47 RAM Area***: The BIOS uses this area to store extended information, such as user definable drive type 47.

  There are two options:

  Default option is **0:300** in lower system RAM

  DOS 1KB in the top 1KB of the 640KB DOS base memory

- ***System Boot Up NumLock***: When the computer boots, it selects the numeric values rather than the cursor control functions on the numeric keypad of IBM compatible keyboards. Most extended compatible keyboards have separate cursor control keys. It is therefore unnecessary to use the numeric keypad for this. The default setting is "On".

- ***Floppy Drive Seek At Boot***: Default is "Disabled". On this setting the system will check the hard disk first to find the disk operating system. This option also allows the user to run the system without a floppy disk drive.

- ***System Boot-Up Sequence***: If "A:, C:" (default), the BIOS will look for bootable operating system files from floppy drive A: first before looking for them in drive C:. You can reverse this sequence by selecting "C:, A:".

- ***External Cache Memory***: Select "Enabled" to enable external on-board cache memory.

- ***Internal Cache Memory***: Select "Enabled" to enable the cache memory inside the 486 CPU chip.

- ***Password Checking Option***: Choose "Setup" or "Always". default setting is "Setup". The password feature can be used to prevent unauthorized system boot-up or unauthorized use of BIOS SETUP.

  "Always" Each time the system is turned on, the pass word prompt appears.

  "Setup" If there is a password set, the Password prompt only appears if you attempt to enter the BIOS Setup program. If there is no set password, the Password Checking Option is disabled. You create a password by using "CHANGE PASSWORD" in the Main Menu.

- ***Video ROM Shadow C000, 32K***: Shadowing helps to speed up BIOS access by copying BIOS code to fast 32-bit RAM area and executes it from there. The default setting is "Enabled".

- ***Adapter ROM Shadow***: Default setting is "Disabled". If you have other expansion cards with ROMs on them such as SCSI controller, you will need to know which addresses the ROMs use.

- ***Boot Sector Virus Protection***: Select 'Enabled' to protect the Boot sector of your hard disk from software virus such as "Michael Angelo".

- ***IDE Block Mode Transfer***: Some latest IDE hard disks support multiple sector (Block Mode) transfer for faster performance. Users select "Enabled" to take advantage of this feature. If your system hard disk supports Block Mode, BIOS message "Block Mode Enabled" will appear during boot-up.

- ***IDE Standby Mode***: Default is "Disabled". If this feature is enabled, IDE hard disk will go into Standby Mode to save power in 15 minutes of no access.

- ***Auto Key-Lock Time-out***: Default is "Disabled". Keyboard will lock up to prevent unauthorized access after an idle period from 1 to 15 minutes. This feature is enabled by setting up system Password and selecting number of minutes.

- ***Cyrix Suspend Feature***: Default is "Disabled". 486 compatible CPUs from Cyrix support Suspend Feature that allows a dramatic reduction in CPU power consumption.

- ***DRAM Speed, DRAM Write CAS Pulse, DRAM Write Cycle***: Select these options according to table below:

CPU Clock Speed	DRAM Speed	DRAM Write CAS Pulse	DRAM Write Cycle
20MHz or 25MHz	Fastest	1T	0 W/S
33MHz	Slower	1T	1 W/S
40MHz	Slower	2T	1 W/S
50MHz	Slowest	2T	1 W/S

- ***DRAM Hidden Refresh***: Select "Enabled" to maximize system performance.

- **Cache Write Cycle, Cache Burst Read Cycle**: Follow below table to set these Cache options.

CPU Clock Speed	Cache Write Cycle	Cache Burst Read Cycle
20MHz or 25MHz	2T	1T
33MHz with 64KB or 256KB Cache	3T	1T
33MHz with 128KB cache	3T	2T
40MHz	3T	2T
50MHz	3T	2T

- **ISA Bus Clock**: Default setting is 7.16MHz for any CPU speed. Latest ISA adapters may operate with ISA bus clock speed up to 10MHz. ISA bus speed above 10MHz is not recommended. Different than 7.16MHz speed can also be selected by following below table.

CPU Clock Speed	ISA Bus Clock
20MHz	1/2 CLK = 10MHz or 1/3 CLK = 6.67MHz
25MHz	1/3 CLK = 8.33MHz
33MHz	1/4 CLK = 8.33MHz
40MHz	1/4 CLK = 10MHz or 1/5 CLK = 8MHz
50MHz	1/5 CLK = 10MHz or 1/6 CLK = 8.33MHz.

- **Latch Local Bus Device, Local Bus Ready**: Follow below table to set these options.

CPU Clock Speed	Latch Local Bus Device	Local Bus Ready
20MHz	2T	TRANS
25MHz	2T	TRANS
33MHz	2T	SYNC
40MHz	2T	SYNC
50MHz	2T or 3T	SYNC

POWER MANAGEMENT SETUP

The Power Management Setup provides a programming way to slow down CPU clock speed and put other system devices such as Video Monitor into power saving mode.

There are five software timers internal to the MEGAKEY keyboard controller that perform power management. These timers are initialized by BIOS with user-defined time-out values from 1 to 255 minutes. The I/O pins that are associated with each timer are hardware design-specific and are defined as connectors JP8 and JP50 on the 486SH motherboard. Please refer to Chapter 2 for detailed description of these connectors.

CPU and devices connected to JP8 and JP50 will go in to power saving mode if the keyboard is not used by user for a period of time programmed through this BIOS option.

AUTO CONFIGURATION WITH BIOS DEFAULTS

Use this option to load the default configuration values directly from ROM. If the stored record created by the Setup program becomes corrupted, these defaults will load automatically when you turn the computer on.

AUTO CONFIGURATION WITH POWER-ON DEFAULTS

Use this option to load the settings detected by the system when you turn it on. It your system behaves erratically you can use this feature to check for incorrect settings.

CHANGE PASSWORD

Follow these steps to change system password. Note that the pass word cannot be longer than 6 characters.

1. Choose "CHANGE PASSWORD" from the Setup Main Menu and press <**Enter**>.

2. If this option has never been used, the screen will display the following message.

Enter NEW Password:

If you want to disable the password option, just press <**Enter**> key to return to the Main Menu.

3. If this option has been used to enter the password, the screen will display the following message:

Enter Current Password:

Enter the current password (default is AMI) and follow the screen instructions to change the password.

4. After you correctly enter the current password, the following message appears prompting you for the new password.

Enter NEW Password:

5. Enter the new password and the following message appears:

Re-Enter NEW Password:

6. Re-enter the new password. If the password is mis-keyed, the following error message appears:

ERROR, Press Any Key...

If the password is keyed in correctly the following confirmation message appears:

NEW Password Installed

7. Press <**Esc**> to exit to the Main Menu.

AUTO DETECT HARD DISK

Use this BIOS utility to automatically detect popular IDE hard disk type if it is not readily available. It is not guaranteed than this utility will work with all IDE hard disk. There is no need to use this utility if you already have hard disk type information.

HARD DISK UTILITY

Use this option to do low-level hard disk format, Auto-Interleave and Media-Analysis of your MFM harddisk drive. IDE, ESDI, and SCSI drives don't need this utility and you should not use it on them.

Low-level **harddisk format** should be done for new harddisks and should be done yearly for used harddisks. This format function allows you to format the entire disk or a part of the disk. **Warning! All data on the harddisk may be lost after a low-level format.**

With **Auto-Interleave** you need not speculate about the value of the interleave factor while entering the parameters for format. This function determines the optimum interleave factor for the best disk performance.

Media Analysis does a comprehensive analysis of the harddisk surface to find out bad patches on your harddisk. This leaves the surface of the harddisk formatted with bad tracks marked bad.

WRITE TO CMOS AND EXIT

After you have made any changes during setup, use this option to store those new information into non-volatile CMOS memory. The system should reboot with the correct system board configuration.

DO NOT WRITE TO CMOS AND EXIT

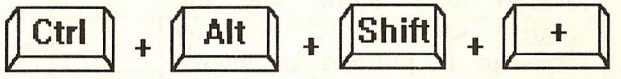
After you have/have not made any changes during setup and decided not to store those information into non-volatile CMOS memory, use this option to exit Setup. The system should reboot with the current configuration stored in CMOS memory.

CHAPTER 5: KEYBOARD HOT KEYS

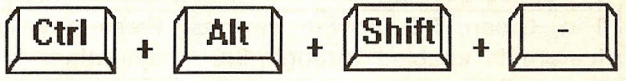
SYSTEM SPEED

System speed can also be changed through keyboard. There are two available speeds as shown below:

Turbo speed: Cache memory and 32-bit DRAM transfer mode are ON. Set by pressing < + > key once while holding <**Ctrl**>, <**Alt**>, and <**Shift**> keys.



Slow speed: Cache memory and 32-bit DRAM transfer mode are OFF. Set by pressing <-> key once while holding <**Ctrl**>, <**Alt**>, and <**Shift**> keys.



SYSTEM SECURITY LOCKING

The default hot key sequence is <**Ctrl**> <**Alt**> <**Backspace**>. When the System Password feature is enabled in BIOS Setup, the user can invoke this feature at any time by pressing this key sequence. This feature is useful for preventing unauthorized access to the system. Once system locking is invoked, the keyboard does not accept anything from the keyboard until the correct password is entered. The Num Lock, Caps Lock, and Scroll Lock LEDS blink when the system is password locked.

SYSTEM POWER DOWN MODE

Pressing <**Ctrl**> <**Alt**> <\> key sequence puts the system into immediate power down mode. This hot key sequence is active if the Green PC system power saving mode is enabled in BIOS Setup.

PASSWORD STATE

The table below lists the Green PC (power saving) hot key sequence and the state of Password in various modes.

System Condition	Information
The password feature is enabled through BIOS Setup and the <Ctrl> <Alt> <Backspace> hot key sequence is pressed.	The Keyboard Num Lock, Caps Lock, and Scroll Lock LEDs blink until the correct password is entered via keyboard.
The password feature is enabled through BIOS Setup and the <Ctrl> <Alt> <\> hot key sequence is pressed to invoke immediate power down mode.	Same as above.
Both the Green PC power savings feature and the password feature are enabled. The system goes to power down state after the time-out period expires.	Same as above.
The Green PC power savings feature is enabled through BIOS Setup, Password is disabled and the <Ctrl> <Alt> <\> key sequence is pressed.	Press any key for full power operation.

APPENDIX A: AMI BIOS HARD DISK TYPE

Type	Cylinder	Heads	Write Precomp	Landing Zone	Sectors	Size
1	306	4	128	305	17	10MB
2	615	4	300	615	17	20MB
3	615	6	300	615	17	31MB
4	940	8	512	940	17	62MB
5	940	6	512	940	17	47MB
6	615	4	65535	615	17	20MB
7	462	8	256	511	17	31MB
8	733	5	65535	733	17	30MB
9	900	15	65535	901	17	112MB
10	820	3	65535	820	17	20MB
11	855	5	65535	855	17	35MB
12	855	7	65535	855	17	50MB
13	306	8	128	319	17	20MB
14	733	7	65535	733	17	43MB
16	612	4	0	663	17	20MB
17	977	5	300	977	17	41MB
18	977	7	65535	977	17	57MB
19	1024	7	512	1023	17	60MB
20	733	5	300	732	17	30MB
21	733	7	300	732	17	43MB
22	733	5	300	733	17	30MB
23	306	4	0	336	17	10MB
24	925	7	0	925	17	54MB
25	925	9	65535	925	17	69MB
26	754	7	754	754	17	44MB
27	754	11	65535	754	17	69MB
28	699	7	256	699	17	41MB
29	823	10	65535	823	17	68MB
30	918	7	918	918	17	53MB
31	1024	11	65535	1024	17	94MB
32	1024	15	65535	1024	17	128MB
33	1024	5	1024	1024	17	43MB
34	612	2	128	612	17	10MB
35	1024	9	65535	1024	17	77MB
36	1024	8	512	1024	17	68MB
37	615	8	128	615	17	41MB
38	987	3	987	987	17	25MB
39	987	7	987	987	17	57MB
40	820	6	820	820	17	41MB
41	977	5	977	977	17	41MB
42	981	5	981	981	17	41MB
43	830	7	512	830	17	48MB
44	830	10	65535	830	17	69MB
45	917	15	65535	918	17	114MB
46	1224	15	65535	1223	17	152MB
47	USER'S	TYPE				

APPENDIX B: MEMORY MAPPING

Address (hex)	Function	Comments
00000000-0007FFFF	512K System RAM	Cached
00080000-0009FFFF	128K System RAM	Cached
000A0000-000BFFFF	128K Video RAM	Not Cached
000C0000-000C7FFF	32K Video BIOS	Cached
000C8000-000CFFFF	32K I/O ROM	Not Cached
000D0000-000DFFFF	64K I/O ROM	Not Cached
000E0000-000EFFFF	64K Extended BIOS	Not Cached
000F0000-000FFFFF	64K On-Board BIOS ROM	Cached
00100000-00BFFFFF	System Memory (RAM)	Cached
00C00000-00FFFFFF	System Memory (RAM)	Not cached if memory mapped I/O board is used in this range
01000000-BFFFFFFF	System Memory (RAM)	Cached
C0000000-C1FFFFFF	System Memory (RAM)	Cached
C2000000-FFFDFFFF	System Memory	Cached
FFFE0000-FFFFFFFF	128K On-Board BIOS ROM	Not cached

APPENDIX C: AT I/O ADDRESS MAP

I/O ADDRESS (HEX)	I/O DEVICE
000 - 01F	DMA Controller 1, 8237A-5
020 - 03F	Interrupt Controller 1, 8259A
040 - 05F	System Timer, 8254-2
060 - 06F	8742 Keyboard Controller
070 - 07F	Real-Time Clock/CMOS and NMI Mask
080 - 09F	DMA Page Register, 74LS612
0A0 - 0BF	Interrupt Controller 2, 8259A
0C0 - 0DF	DMA Controller 2, 8237A-5
0F0 - 0FF	CPU's Internal Math Coprocessor
1F0 - 1F8	Fixed Disk Drive Adapter
200 - 207	Game I/O
20C - 20D	Reserved
21F	Reserved
278 - 27F	Parallel Printer Port 2
2B0 - 2DF	Alternate Enhanced Graphic Adapter
2E1	GPIB Adapter 0
2E2 - 2E3	Data Acquisition Adapter 0
2F8 - 2FF	Serial Port 2 (RS-232-C)
300 - 31F	Prototype Card
360 - 363	PC Network (Low Address)
364 - 367	Reserved
368 - 36B	PC Network (High Address)
36C - 36F	Reserved
378 - 37F	Parallel Printer Port 1
380 - 38F	SDLC, Bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	Bisynchronous 1
3B0 - 3BF	Monochrome Display and Printer Adapter
3C0 - 3CF	Enhanced Graphics Adapter
3D0 - 3DF	Color/Graphics Monitor Adapter
3F0 - 3F7	Diskette Drive Controller
3F8 - 3FF	Serial Port 1 (RS-232-C)
6E2 - 6E3	Data Acquisition Adapter 1
790 - 793	Cluster Adapter 1
AE2 - AE3	Data Acquisition Adapter 2
B90 - B93	Cluster Adapter 2

EE2 - EE3	Data Acquisition Adapter 3
1390 - 1393	Cluster Adapter 3
22E1	GPIB Adapter 1
2390 - 2393	Cluster Adapter 4
42E1	GPIB Adapter 2
62E1	GPIB Adapter 3
82E1	GPIB Adapter 4

APPENDIX D: INTERRUPT ASSIGNMENTS

LEVEL	TYPICAL INTERRUPT SOURCE
NMI	Parity, AT Channel Check
IRQ0	Interval Timer 1, Counter 0 Out
IRQ1	Keyboard Controller
IRQ2	Cascade Interrupts from IRQ8 to IRQ15
IRQ3	Serial Port 2
IRQ4	Serial Port 1
IRQ5	Parallel Port 2
IRQ6	Diskette Controller
IRQ7	Parallel Port 1
IRQ8	Real Time Clock
IRQ9	Expansion Bus Pin
IRQ10	Expansion Bus Pin
IRQ11	Expansion Bus Pin
IRQ12	Expansion Bus Pin
IRQ13	Coprocessor Error
IRQ14	Fixed Disk Drive Controller
IRQ15	Expansion Bus Pin

APPENDIX E: ENVIRONMENTAL SPECIFICATION

TEMPERATURE RANGE

Operating: 50° to 104° Fahrenheit (10° to 40° Celsius)

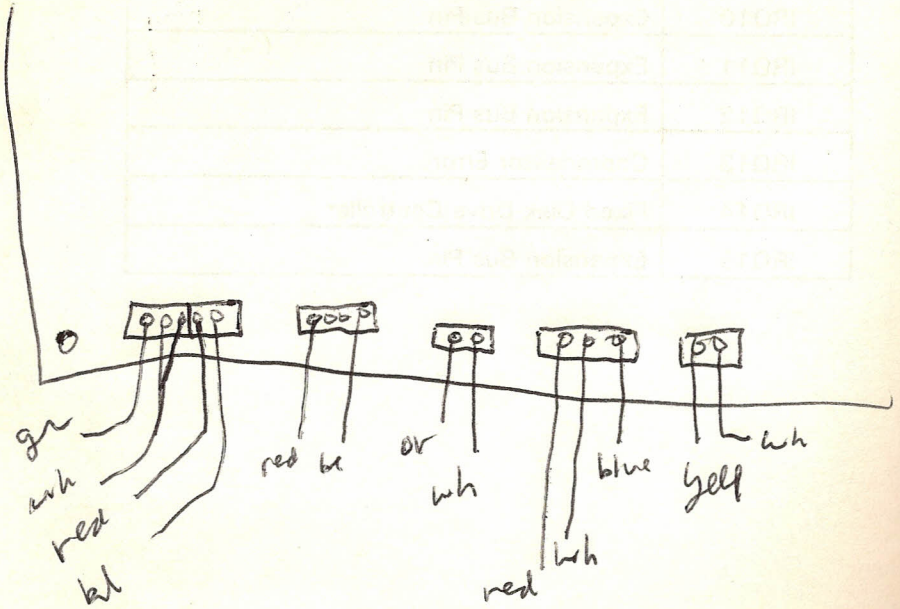
Non-Operating: 50° to 104° Fahrenheit (10° to 40° Celsius)

Shipping: -22° to 140° Fahrenheit (-30° to 60° Celsius)

RELATIVE HUMIDITY (NON-CONDENSING)

Operating: 20% to 80%

Non-Operating: 5% to 90%



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